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ABSTRACT

This paper summarizes most of what Sign linguists know about the function of the eyes in American Sign Language discourse. Here, "eyes" is taken to cover both opening and closing of the eyes and looking in a particular direction, referred to as the signer's "gaze-direction." Evidence is presented demonstrating that a signer's gaze can be lexically determined or function in emphasis placement, as a noun modifier, a pronominal reference, an indicator of a direct quotation narrative, or as evidence of a constituent boundary. Closing the eyes may give greater emphasis to a manual sign. Finally, it is hypothesized that the location of blinks in ASL discourse corresponds to the interactants' organization of the communication and may be a fruitful source of information in locating and describing the syntactic constituents of American Sign Language. (Author)

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EYE-OPENERS IN ASL*

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The aim of this paper is to summarize most of what Sign linguists know about the use of the eyes in American Sign Language discourse, and then to present and discuss some recent findings on how the detailed analysis of eye movements may be very useful in our efforts to put together a grammar of ASL. The cover term, 'eyes', includes both opening and closing of the eyes and looking in a particular direction- referred to as the signer's 'gaze-direction'. Brow movements will not be included in this discussion because they are components of another 'channel'i- the face.

I. Regulatory Functions of Gaze-direction

Signed conversation differs uniquely from oral discourse in that a speaker cannot initiate a turn until the desired addressee looks at that potential speaker - i.e. an interactant cannot 'say' something and be 'heard' if the other interactant is not looking.

Exactly where does the addressee look? Unlike what hearing interactants in signed discourse often do, deaf addressees do not look at the speaker's hands. A few exceptions to this generalization are found when a sign is made out of the normal signing space[2] and the addressee must look to where the sign is made. Sometimes when particular focus is given to a fingerspelled word (e.g. when someone's name is fingerspelled during introductions, or when the word is unusual), the addressee will look at the hand that is doing the fingerspelling. At those times, the speaker usually draws the addressee's attention to the fingerspelled word(s) by also looking at that hand and perhaps, by pointing to it with the index finger of the other hand.

Location of addressee '+GAZE'[3] on the speaker generally varies within a region extending from the speaker's eyes to his/her mouth. Why do addressees look at this eyes-to-mouth area? One reason is because so much linguistic information is carried by the face. For example, there are lexical items in ASL made solely by variations in the signer's facial musculature (Baker, 1976). Negation and interrogatives (Stokoe, 1960; Bellugi & Fischer, 1972) as well as relative clauses (Liddell, 1975) are often marked uniquely on the face. In addition, changes in a signer's gaze-direction can signal a clause boundary (Baker, 1975) or function as a pronominal reference (Baker, 1976).

Thus, addressee gaze on the speaker's face, or +GAZE, can be taken as a 'given' in signed discourse with the few exceptions mentioned above. One final exception is the case where the addressee wants to initiate a turn and does so by waiting until the speaker is +GAZE at a within-turn clause boundary and then by switching to -GAZE and beginning signing. This is considered an interruption and is found in competitive turn exchanges.

On the other hand, speakers spend much of their signing time not looking at the addressee. Analysis of a 45 seconds stretch of competitive discourse (5 separate turns) between two males revealed the ratio of speaker ±GAZE to be approximately 50 - 50. Time not spent looking at the

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addressee is thought to be a function of (1) the need for 'advance planning' (Kendon, 1967), that is, the need to concentrate on what to say next without being distracted by feedback from the addressee, and (2) the speaker's ability to hold the floor via -GAZE since the addressee cannot effectively initiate a turn in the absence of speaker +GAZE. Thus, at clause boundaries, one way in which speakers signal that they wish to continue their turn is by not looking at the addressee (speaker continuation regulator). When speakers are nearing the end of their turn, they always return to +GAZE (speaker shift regulator) so that the addressee may initiate a turn and so that the exchange of turns will be 'smooth' (Baker, 1975).

Equipped with this understanding of how the eyes are used to regulate turn-taking in ASL discourse, we can now begin to consider some of the linguistic functions of different eye movements.

II. Lexically-determined Eye Movements

There is a certain set of signs for which the speaker's gaze-direction appears to be lexically determined. For this set, the eyes seem to visually index (point at) the spatial referent of the sign - that is, visually index the area shaped by the hands in, for example, FIELD, MOUNTAIN, or RIVER, the set of things referred to by ALL, the person who gets taller in GROW-UP, and the people as they move toward each other in ASSEMBLE.

When the sign refers to an activity which in some way involves the eyes, then the signer's eyes will imitate their real-world movements. For example, the signer will look all around during SEARCH, at the object of SEE or LOOK-AT, or up in the air (though the eyelids may be more closed) during IMAGINE or DREAM.

Most of these lexically-determined gaze-directions are not felt to be mandatory. That is, when asked to make the sign in a sentence without its usual visual index, most signers are able to do so (though not always easily). However, whenever such signs are elicited in context or found in free conversation transcripts, these particular eye movements are always present. When asked about these concomitant visual indices, signers report that no greater emphasis is being given to those signs than to others - which is unlike the emphasis reported when visually indexing signs which do not normally require any specific eye movements (see Section VI).

Which set of signs is it that receives this special eye indexing? In physical terms, all of the signs found so far to consistently occur with a particular eye movement are signs which do not involve contact with the body (with the exceptions of IMAGINE and DREAM which sometimes begin with an initial contact on the forehead and then move up and away from the signer). In other words, these signs are made in neutral space[4] and thus, can be easily 'looked at'.

Secondly, my intuition is that the set is related to a certain kind(s) and perhaps, degree of iconicity of the signs involved. For example, one is able to easily visualize the MOUNTAIN as it is traced by the palm(s) of the signer's hands, or the people moving toward each other in ASSEMBLE where the fingers of one hand 'walk toward' the similarly moving fingers on the other hand. However, the contact of the two crooked index fingers in FRIEND seems to be more symbolic of the

union and does not visually model or outline the friend in such a way that he/she can be looked at. Similarly, the signs HURRY, FINISH, HOPE, TRY, and PROMISE do not seem to enable the signer to visualize the experiencer or object of the action.

However, since we still have no clear definition of what is 'iconicity' in a sign language (see Battison, 1971; Frishberg, 1975; Mandel, 1975), trying to relate eye-indexing to signs classed by their type or degree of iconicity is merely speculative.

III. Modifier Functions of Gaze-direction

There is another kind of eye-indexing which appears to function like a noun modifier. For example, in describing how facial movements can function adjectivally to express the concept 'big' in the elicitation of 'big tree', Baker (1976) mentions that the eyes will first look at the place where the tree will be manually signed and then will look up to show that the tree is 'big'. Conversely, the eyes look down when facially expressing that the tree is 'tiny'.

Similarly, when 'short road' is signed with facial movements[5] functioning as the modifier, the eyes closely follow the hands as they outline the road. However, in 'long road', the eyes are constantly ahead of the hands as if to demonstrate that the road keeps going on out into the distance.

IV. Gaze Pronominal Reference

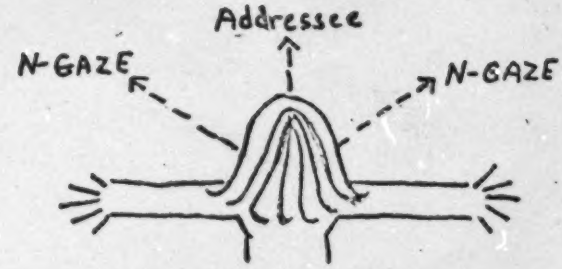
Eye-indexing may also function pronominally (Baker, 1976), and the form of the reference will vary contextually. For lack of more imaginative terms, I will call two variants of this gaze pronominal reference 'normal gaze' (N-GAZE) and 'secretive gaze' (S-GAZE). The normal gaze is illustrated in examples (1) and (2).[6]

(1) MONTH PAST MY FRIEND LEAVE GALLAUDET ME [MISS
N-GAZE (right)]
'Last month, my friend left Gallaudet. I miss him.'

(2) YESTERDAY TEACH AGENT BLOW-TOP ANGRY
N-GAZE (lf) FEEL STUDY AGENT HARD WORK MORE SHOULD
'Yesterday, the teacher really blew his tip. He felt the students should be working harder.'

Here the gaze is composed concomitantly of a retracting of the upper eyelids and a head nod and focus in the direction of the spatial referent (place in area around the signer's body where the referent is established for many purposes, one of which is pronominal reference). This point in space where the referent is established lies approximately 45° to the front left/right of the signer (as seen in Figure 1) where the distance of that point from the signer is approximately an arm's length.

Figure 1.



As implied by its name, the secretive gaze can be used to refer to nearby third parties without their knowing or used when the speaker is saying something negative about another person (not present). See examples (3) and (4).

(3) KNOW-THAT BOY T-E-D [TRUE / S-GAZE (rt)] STRANGE

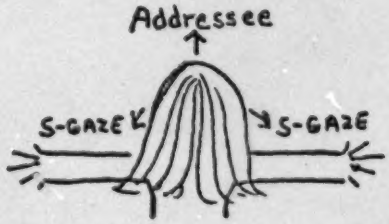
'You know that guy, "Ted"? He's really strange.'

(4) FRIEND ME GO MOVIE SIT LOOK-AT
(slow) S-GAZE (rt) DRUNK
S-GAZE (lf) (elbow nudge left) S-GAZE (rt) DRUNK

'A friend and I went to the movies. We sat down and were watching the film when I noticed that the guy next to me was drunk. So I nudged my friend and said, "Hey that guy's drunk!".'[7]

The spatial referent of the secretive gaze is usually located around the inside shoulder of the speaker, as seen in Figure 2. Here the head nod toward the referent is optional and is very small, if present.

Figure 2.



If the third party is present in the room, then the gaze will be rapid and in the direction of that party.

V. Direct Quotation

Bellugi & Fischer (1972) discuss the function of gaze-direction in direct quotation narratives. Here the interactants in the story are given locations in space and usually, certain facial attributes. With a slight body turn away from a location and by assuming the appropriate facial expression, the s.. er 'becomes' that interactant and looks at the other interactant(s). Or, if the interactants can be characterized by different heights, then the signer may simply look up (now as the child) and look down (now as the mother). Whatever is signed while holding that position is what the interactant in the story said. Thus, the change in gaze-direction, facial expression, and posture has the effect of putting whatever is signed in quotes as well as of specifying

to whom the quote belongs.

Notice that in direct quotation narratives, the signer is looking from the location of the spatially-defined interactants, whereas in the case of gaze pronominal reference, the signer looks toward the location of the spatially-defined referent.

VI. Emphatic Eye Closure

Baker (1976) has reported two different ways in which the eyes seem to function to give emphasis to a manual sign. One way is to close the eyes during the sign (emphatic closure), and the other way is to look at the hand(s) as they make the sign (where this gaze is not lexically determined). The former seems to occur atop noun/verb modifiers whereas the latter occurs with noun/verb signs.[8]

In that paper, Baker made a distinction between emphatic closure and normal blinking on the basis of length. She observed that closing the eyes for 8-10 fields (approximately 3/20 second) often occurred when a sign was manually stressed whereas normal blinking seemed to involve a closure of 4-6 fields.

Normative studies (Gordon, 1951; Bung, 1976) report that most blinks last from 200-300 milliseconds, or 1/4 second, where these figures correspond to the total eyelid movement (all the way up and down, although some blinks do not involve total closure). If only the 'darkness interval', or the time when the upper lid is covering the pupil is measured (which is the minimum period when a person cannot see), then the average length is 100 ms, or 1/10 second (=6 fields on videotape). Finally, these figures may vary between individuals depending upon the person's 'palpebral fissure', or the area exposed between the eyelids. Individuals with smaller or larger palpebral fissures will have shorter or longer blinks, respectively.

Baker's distinction was based upon measurement of the darkness interval of those closures transcribed primarily from a videotape of a facial close-up of a deaf man with an extremely small palpebral fissure. Continued measurement of such closure in other deaf subjects has shown that the earlier quoted figures do not hold true across individuals, but are actually shorter than usual.

The length distinction between emphatic closure and normal blinking also does not seem to be nearly so important across individuals as is the fact that emphatic closure is usually accompanied by other channel behaviors, such as a particular tension of the facial musculature, or possibly a sharp head nod, or manual stress on the sign the closure accompanies. In addition, it does generally hold true that emphatic closure occurs atop, or at the same time as, the sign being stressed whereas normal blinking usually occurs between signs.

An example of emphatic closure is seen in (5).[9]

(5) 'If I had several true friends ...'

	.10.2	.10.4	.10.6	.11.0-.2
eyes		close eyes		open
face		brow squint		normal brow
head		tilt right	sharp retur	
hands	HAVE		TRUE	FRIEND ...

Here the emphatic closure (lasting approximately 1/2 second) is accompanied by a sharp nod of the head, a squinting of the brows, and manual stress on the sign TRUE.

VII. Gaze Direction and Sentence Structure

Researchers and teachers have been continually confronted with the problem of discerning sentence boundaries in American Sign Language. One aid toward locating these boundaries arose from the observation that, like speakers of oral languages, signers tend to look back at their addressees at what seem to be constituent boundaries. This is probably done to check on addressee decoding, and, in effect, serves to signal the boundary of that constituent (Baker, 1975).[10]

However, the frequency of occurrence of this kind of shift in gaze-direction seems to be a function of the context of the interaction as well as of the different individual styles of speaking. Frequent shifting takes place in competitive turn exchanges where the use of -GAZE is an important means of holding the floor. This seems to be particularly true of males. In long-turn sequences where there is less competition for the floor, less gaze shifting takes place. Although the shifts found in long turns do seem to occur at constituent boundaries, many other similar constituent boundaries are not so marked. Thus, gaze shifts during long turns do not provide adequate information for discerning such boundaries.

Since more gaze shifts occur in competitive turn exchanges, these exchanges might be more fruitful sources of information. However, in these cases, several other problems arise, such as those of discourse overlap and simultaneous turns - both of which require mutual +GAZE. In addition, there remains the problem of separating out when the gaze shift is lexically determined as opposed to regulated by grammatical relationships.

VIII. Blinking Behavior and Sentence Structure

Who would have ever thought that blinks could tell us something about sentence structure ?! Well, an initial look at where blinks are found in signed discourse strongly suggests that their occurrence is systematic with respect to the grammatical structure of ASL (Baker, Newman & Padden, 1976).

First of all, the examples below are translations from English into ASL by a native deaf signer.[11] 'EB' stands for where an eye blink occurred on a videotape of the elicitation session.[12]

(6) English: My father left and my mother cried.
ASL: (EB) MY FATHER (EB) GO (EB) (EB)
MY MOTHER (EB) CRY ++(EB)

(7) English: If my father leaves, my mother will cry.
ASL: (EB) SUPPOSE (EB) MY FATHER GO (EB)
MY MOTHER (EB) CRY ++(EB)

(8) English: If it rains tomorrow, I can't go to the beach.
ASL: TOMORROW (EB) SUPPOSE TOMORROW RAIN (EB)
ME CAN'T TAKE-OFF BEACH ME (EB)

(9) English: If tomorrow turns out to be cold, I can't go to the beach.
ASL: SUPPOSE (EB) TOMORROW COLD* (EB)
ME CAN'T GO BEACH WELL (EB)

In these sentences (as in the case of free conversation data), the location of blinks often corresponds to the place where other channel behaviors also occur. For example, the brows are raised on SUPPOSE in (7)-(9) and then lowered after the last sign in the 'if' clause. In (8), the head is tilted back after GO and then turned left after MOTHER. In (7), the head is turned to the right with the upper eyelids retracted throughout MY FATHER GO after which the eyelids are lowered and the head returns to normal position.

It is still too early in the analysis to determine exactly what units blinks are bounding. However, in the above examples, it is clear that blinks do not simply mark (English) clause boundaries. As seen in (6) and (7), subjects and predicates also may be separated from each other by a blink. What Fant (1972) calls 'time indicators' also seem to be set off by occurring initially then followed by a blink as in (8), although sometimes it is not a blink which follows, but a gaze shift, as seen in Footnote 10.

The following is a small extract (21 lines) from a long turn (43 lines) in a free conversation between two deaf females. An asterisk before each line signals that a blink occurred there. Small parentheses before a line correspond to where a lengthy eye closure (6/10 second or more) occurred. To the right is an approximate English translation of the signed sequence as rendered by C. Padden, a woman bilingual in ASL and English.

(11)a	*INDEX[13] NOT KNOW POSSESS NAME++	She (the girl) didn't know her name.
b	*THAT INDEX MEET TWO CHILDREN INDEX	Later, she met two children.
c	*INDEX WELL WANT HELP	They decided they wanted to help
d	*H-E-R INDEX AROUND	her. The story goes on.
e	*ASK THAT INDEX AUDREE	They asked Audree for help.
f	() INDEX ACT SAME TEACH AGENT SPEECH++ T-H-E-R-A-	She was acting like a teacher, a speech thera-
g	*P-I-S-T (looking at hands)	pist.
h	*TEACH SAY	She taught the girl how to say
i	*POSSESS NAME B-U-F-F-Y	her name 'Buffy'
j	*B-U-F-F-Y	'Buffy'
k	**GIRL LOOK (interruption)	The girl watched Audree's mouth.
l	**B-U-F-F-Y B-U-F-F-Y	'Buffy'? 'Buffy'?
m	*CUTE NAME	Cute name?
n	*MOTHER LOOK	The girl's mother saw that
o	(if) TRUE CAN LEARN	"My child can truly learn!"

p (lf) OH!	"Oh...!"
q **WELL	So
r *TELL POSSESS NAME	If you said, 'Say your name',
s *GIRL A-B-L-E SPEAK POSSESS NAME	the girl was able to say her name.
t *WELL	Well
u () IDEA+ START...	It's the idea of it, to start somewhere...

Looking at the English translation for each line, it appears here that most ASL units bounded by eye blinks correspond to English propositions, although some units are smaller. For example, in lines (h) and (i), the blink sets off what in the English translation is the object of a subordinate clause. In other sections of the transcript, subjects are sometimes separated from predicates, and direct objects may be similarly distinguished. However, any discussion of what kind of unit in ASL is bounded by a blink is necessarily circular. It is precisely because we do not know what constitutes a grammatical unit or relationship in ASL that we are looking at where blinks occur.

A second problem with this approach is that we may be (and probably are) imposing English/oral language-bound, linear, grammatical relationships on the ASL sequences. However, we have already had our expectations denied several times with respect to where we anticipated a blink and where one actually occurred. If blinks do mark syntactic units, then this kind of disagreement may help us understand how ASL is organized differently from English.

In addition, it is useful to look at where addressee blinks occur. During the whole sequence from which the above extract was taken, the addressee blinked only half as many times as the speaker. However, most of her blinks occurred at the same places as where the speaker blinked. At one point, when she interrupted and was signing simultaneously with the speaker, her blinks then seemed to be coordinated with her own speech, as seen below.

(12)a ME NOT WATCH T-V MUCH	I don't watch much TV.
b *AWFUL ME	Awful, isn't it?
c *ANYWAY INDEX	Anyway, you were saying...

Looking at where addressee blinks occur in the absence of speaker blinks may also be a source of information about what can constitute a grammatical unit in ASL. That is, if it is true that addressees facilitate their own decoding by anticipating the location of unit boundaries (which helps them organize grammatical relationships within the proposition), then looking at where this speaker-addressee disagreement occurs may suggest (1) what could have been a grammatical unit, and (2) how the speaker can deviate grammatically from that unit.

Re-examining the data extract, there are three places where such discrepancies occurred. On line (a), the addressee blinks before what is English is the direct object, 'her name'. It was mentioned earlier that speakers sometimes blink in similar places. Secondly, on line (b), the addressee blinked after the sign CHILDREN whereas the speaker added an index to the spatial referent of the sign before blinking. If the

addressee has correctly anticipated a possible grammatical unit, then we may consider this final INDEX to be optional. The third case is found on line (f) where the addressee blinks after AGENT, not knowing that the speaker would add on a second more descriptive term for Audree's role.

There are a few places where the speaker blinks which require a special explanation. One occurs on line (c) where the object, H-E-R, is separated from HELP by a blink. Although blinks sometimes do occur before what in English are direct objects, we feel the blink here may be due to an intrusion from Signed English (a system which uses ASL signs, but English syntax). There are no fingerspelled pronouns in ASL. Since it is clear from the context that the deaf girl is the one who will be helped, the signed proposition should have ended with HELP - which is where the addressee also blinked. However, there does seem to be a recent trend among ASL users with college-level education in English to occasionally add on fingerspelled pronouns - which is thought to favorably enhance the level of the communication. In any case, if the H-E-R has special status here, then we may be able to feel better about the lack of a blink before the INDEX on line (d)!

Why does the speaker blink after the letter 'A-' in 'therapist' on line (f)? First of all, we already know that speakers often look at the hand that is doing the fingerspelling when the word is unusual or is difficult to spell. In this case, line (f), the speaker looks at her hand after she blinks. Secondly, we know that people blink more during periods of stress (Kanfer, 1960). Earlier in the text, the speaker misspelled 'affair' as A-I-F-A-I-R and tried to correct her spelling A-F (EB)-F-A-I-R. Since blinks occurred during these two words, but not during easier words in the same transcript (such as K-I-D-S, T-V, A-B-L-E, H-E-R), we surmise that the blinks here were due to greater concentration and thus, stress.

Related evidence for this claim may be seen on lines (l)-(n) where double blinks separate the constituents. It is exactly during this period in the speaker turn that the addressee interrupts saying, 'B- what? Oh! Buffy!'. This and other instances of increased blinking during interruptions suggests that we will need to be cognizant of other influences on blinking behavior during our examination of what blinking can tell us about sentence structure.

Lines (o) and (p) are not marked by blinks, but by changes in gaze-direction which function to signal a direct quotation from an interactant in a story (see section V). As mentioned earlier, we have found other places which look like unit boundaries, where only a change in gaze-direction occurs - which suggests that blinking and gaze shifts are coordinated in some way with each other.

If we accept then that blinking behavior in ASL discourse can be used to discern what are possible and actual grammatical units in the language, then we have a working strategy. For example, in (13), we could translate the ASL sequence into English in either of two (maybe more) ways, as seen in (13a) and (13b).

(13) ME THINK FILM USE ONE MOTHER...
  a. I think that the film had one mother in it who...
  b. I think in the film there was one mother who...

During the sequence from which the above example was selected, the speaker blinked after FILM, as in (14).

(14) ME THINK FILM (EB) USE ONE MOTHER...

Using our strategy for discovering grammatical units in ASL and their relationship to each other, we might then feel more inclined to chose translation (b) over translation (a) - which changes our understanding of the grammatical function of FILM.

As stated earlier, 'time indicators' (such as TOMORROW and TWO NIGHT PAST) seem to have special status as indicated by the blinking or gaze-shifting behaviors which follow them. Perhaps each mention of time in ASL is a separate proposition. We know their occurrence is especially important since all subsequent propositions are understood as taking place during that time frame until otherwise indicated.

These are just a few of the new directions for research recommended by the analysis of blinking behavior during signed discourse.

IX. Additional Evidence for the Systematicity of Blinking

Suggesting that the exact placement of blinks may be related to the grammatical organization of a proposition is not so surprising on second glance. Blinking may, in part, be a response of the autonomic nervous system to the mental organization of syntactic units. For example, Hall (1945) found that people who blink at clause boundaries while reading are better readers than those whose blinking behavior is more sporatic.

Condon & Ogston (1971) have also shown that blinking is precisely timed with respect to word boundaries. They report that the majority of blinks occur either at the beginning of a word or right after its completion. Co-occurrence of the blink with word initiation/termination is accurate to 1/24 second! In the few cases where blinking is found word-internally, it seems to occur at exactly those points of articulatory change, such as at the onset of voicing or aspiration. Thus, we may conclude that blinking is systematic, at least with respect to word boundaries. To our knowledge, Condon and Ogston have not looked at the possible relationship between blinking and English sentence structure, but did comment that there was "a tendency for an utterance to have at least one or more blinks (p.238)".

X. Conclusion

The net product of the preceding sections is, hopefully, a new awareness of the significance and the complexity of eye movements in signed discourse. The direction in which a signer looks has been presented as a function of both turn-taking and linguistic concerns. The gaze can be lexically determined or function in emphasis placement, as a noun modifier, a pronominal reference, an indicator of a direct quotation narrative, or as evidence of a constituent boundary. Closing the eyes may give greater emphasis to a manual sign. Finally, it is hypothesized that the location of blinks in ASL discourse corresponds to the interactants' organization of the communication and may be a fruitful source of information in locating and describing the syntactic constituents of American Sign Language.

FOOTNOTES

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[1]Wiener and Mehrabian (1868) define 'channel' as "any set of behaviors in a communication that has been systematically denoted by an observer, that is considered by that observer to have coding possibilities, and that can be studied (at least in principle) independently of any other co-occurring behaviors (p.51)".

[2]The signing space (as described by Friedman, 1973) approximates a rectangle extending vertically from the waist to about 6" above the head, the width of which is determined by the signer's lax arm spread.

[3]GAZE refers to looking at the other signer in the mouth-to-eyes region of his/her face. A signer who is +GAZE is looking at the other interactant's face. If an interactant is -GAZE, then he/she is not looking at the other's face.

[4]Neutral space is that area of the signing space in which a very large number of signs are made. It has no well-defined boundaries, but generally refers to the area in front of, but not in contact with, the signer's chest.

[5]Although the modifier function has been attributed primarily to movements of the facial musculature, concomitant behaviors in other channels are also important, as well as the modification of the actual manual sign to make it more consistent, descriptively, with the particular referent. A question for future research is how much of this cross-channel variation is redundant and how much is important in carrying nuance of meaning?

[6]All words in capital letters are English glosses for ASL signs- which are written left-to-right on a horizontal time line. Words separated by hyphens are signs that require more than one English word as their gloss. Constituents within brackets were signed simultaneously. (However, in these examples the constituents could have occurred separately.) The actual direction of the gaze is given in parentheses: 'rt' = right, 'lf' = left. A '+' after a sign means that sign was repeated. Hyphens between letters mean a word was fingerspelled.

[7]Lou Fant is the author of this example. (However, any misinterpretation is my own.)

[8]Besides the fact that these two kinds of emphasis seem to occur with syntactically different sets of signs, there is another felt difference in 'tone' between the two. Emphatic closure may be more closely related to intonational stress in English. However, when a signer looks at, for example, his/her shaping of HOUSE (which does not lexically require any particular gaze-direction), there is an expectation that the signer will then give some further description of the house. Thus, it would be anomalous to look at the HOUSE when making a one-sentence reply, 'I'm going to my house'. However, if I were going to describe the house as having green shutters, a kitten in the window, and daisies on the front lawn, then it seems inappropriate to <u>not</u> look at the HOUSE.

[9]Here components within four channels are coded along the time line. Only changes occurring across time are marked and should be read as continuing in time until otherwise specified. The exact times for each component change are also indicated to a tenth of a second. So the first time marking indicates that the sign HAVE was made at 10.2 seconds on the videotape. Stress is marked here by placing an asterisk after the sign, as in TRUE*.

[10]An example taken from Baker (1975) of the co-occurrence of gaze-shifting and probable constituent boundaries is seen below. Behaviors of both interactants, Tom and Joe, are transcribed along the same time line with each subsequent bracketing following in time the one that precedes it. Dots following the initial letter of each signer's name correspond to the period when each signer was +GAZE.

```
Tom: YOU DO YOU DO LAST-FEW-DAYS DO+ YOU LAST-FEW-DAYS DO+
  T                                  ..................................
  J ..................................                  .........
Joe:                                      TWO           NIGHT PAST

Tom:
  T ..........................................................................
  J      .....                  ...                 ...............
Joe: ME WATCH MOVIE TITLE DIRTY H-A-R-R-Y AND WELL M-A-G-N-U-M F-O-R-C-E

Tom:                                ? DIRTY MOVIE GOOD+
  T ..........................................................................
  J                             ..............................      ...
Joe: ACT B-Y C-L-I-N-T EAST W-O-O-D                          DIRTY NOT DIRTY

Tom:                          DETECTIVE + + + +      (indexes Joe) S-F
  T ..........................................................................
  J .....  ..............................      ...................
Joe: MOVIE ABOUT DETECTIVE+ STORY DETECTIVE ACT IN S-F
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Translation: Tom asks, 'What have you been doing in the last few days?' Joe replies, 'Two nights ago, I saw a movie called <u>Dirty Harry</u> and another, <u>Magnum Force</u>, starring Clint Eastwood.' Tom misunderstands Joe to say it was a 'dirty movie' and asks, 'Oh, it was a dirty movie! Was it good?' Joe corrects him, 'It wasn't a dirty movie. It was a story about a

detective in San Francisco.' As marked by the speaker's return to +GAZE, the constituents are: (a) TWO NIGHT PAST (b) ME WATCH MOVIE (c) TITLE DIRTY H-A-R-R-Y (d) AND WELL M-A-G-N-U-M F-O-R-C-E (e) ACT B-Y C-L-I-N-T FAST W-O-O-D (f) DIRTY NOT (g) DIRTY MOVIE (h) ABOUT DETECTIVE STORY DETECTIVE (i) ACT IN S-F.

[11]Discussion of the relationship between blinking and syntax comes from observation of four deaf informants.

[12]Transcriptions of these sentences and blinking behavior during their signing was made available by Carol Padden.

[13]INDEX here refers to pointing with the index finger to that area of the signing space where a particular referent has been established. This pointing, or indexing, functions as a pronominal reference.

BIBLIOGRAPHY

Baker, C. 1975. Regulators and Turn-taking in American Sign Language Discourse., MS, Univ. of California, Berkeley. (To appear in On The Other Hand: New Perspectives On American Sign Language, ed. Friedman (New York: Academic Press).
1976. What's Not On the Other Hand in American Sign Language., In Papers From the Twelfth Regional Meeting of the Chicago Linguistic Society. University of Chicago.
K. Newman & C. Padden. 1976. Now You See It, Now You Don't: Blinking Behavior in American Sign Language Discourse., MS, University of California, Berkeley.

Battison, R. 1971. Some Observations on Sign Languages, Semantics, and Aphasia., MS, University of California, San Diego.

Bellugi, U. & S. Fischer. 1972. A Comparison of Sign Language and Spoken Language., Cognition 1, 173-200.

Condon, W. & W. Ogston. 1971. Speech and Body Motion Synchrony of the Speaker-Hearer., In The Perception of Language, eds. Horton & Jenkins (Columbus, Ohio: Charles E. Merrill).

Fant, L. 1972. Ameslan: An Introduction to American Sign Language. (Northridge, California: Joyce Motion Picture Co.).

Friedman, L. 1975. Space, Time and Person Reference in American Sign Language., Language 51.4.

Frishberg, N. 1975. Arbitrariness and Iconicity: Historical Change in American Sign Language., Language 51, 3, 696-719.

Gordon, G. 1951. Observations Upon Movements of the Eyelids., Brit J of Opthamology 25, 339-351.

Hall, A. 1945. The Origin and Purposes of Blinking., Brit J Opthamology September, 445-467.

Hung, G. 1976. Modeling of the Eyelid During Blinking. (title tentative), MS, School of Optometry, Univ. of California, Berkeley.

Kanfer, F. 1960. Verbal Rate, Eyeblink, and Content in Structured Psychiatric Interview., J Abn Soc Psychol 61, 3, 341-347.

Kendon, A. 1967. Some Functions of Gaze Direction in Social Interaction., Acta Psychologica 26, 22-63.

Liddell, S. 1975. Restrictive Relative Clauses in American Sign Language., MS, Salk Institute, San Diego, California.

Mandel, M. 1975. Iconic Devices in American Sign Language., MS, University of California, Berkeley. (To appear in On The Other Hand: New Perspectives On American Sign Language. ed. Friedman (New York: Academic Press).)

Stokoe, W. 1960. Sign Language Structure: An Outline of the Visual Communication of the American Deaf. Studies in Linguistics, Occasional Paper 8. (Buffalo).

Wiener, M. & A Mehrabian. 1968. Language Within Language: Immediacy, a Channel in Verbal Communication. (New York: Appleton-Century-Crofts).